Small Business Innovation Research/Small Business Tech Transfer

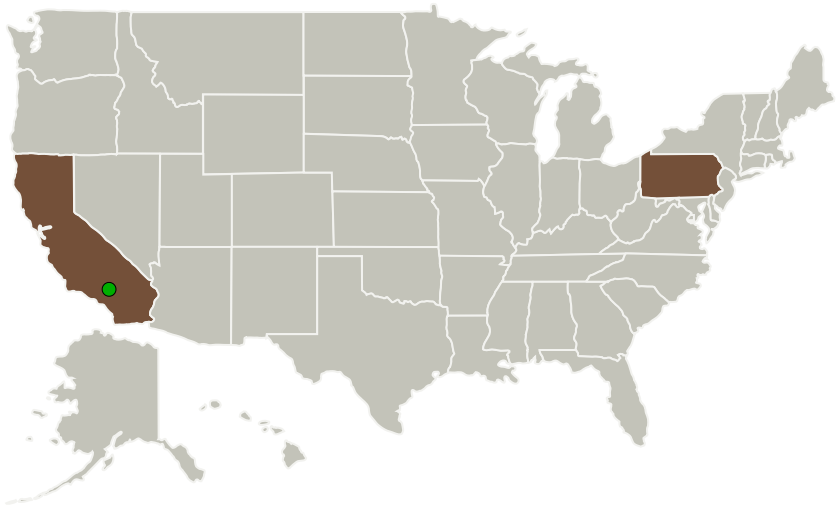
RF Emission-Based Health Monitoring for Hybrid and/or All Electric Aircraft Distributed Propulsion S, Phase I

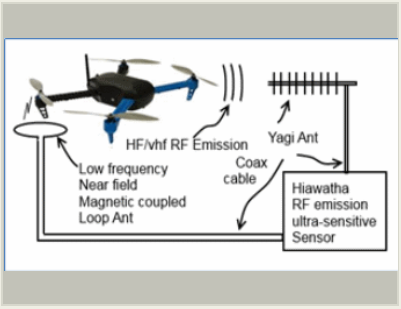
Completed Technology Project (2016 - 2016)

Project Introduction

Future aircraft propulsion is destined to be electric. All electric aircraft propulsion systems promise significant improvements in energy efficiency, maneuverability, safety, reliability, reduced maintenance costs, noise reduction, higher lift, shorter takeoff, and other factors. NASA's LEAPtech technology is the major departure from the current state-of-art aircraft vehicle/engine design, possibly enabling unprecedented performance and design flexibility...and [can] maximize total vehicle performance. This offers new opportunities to monitor aircraft propulsion components, on the ground or continuously in-flight. Nokomis has developed and installed a system for testing electronic components for Air Force procurement and maintenance spanning non-contact measurement of electronic part degradation, part aging and predicting onset of part failure. We propose a system whereby Electromechanical Health and Remaining Useful Life (RUL) can be determined real-time in-flight using motor's unintended Radio Frequency emissions, making flight testing such aircraft safer, and detecting dangerous conditions before they materialize.

Primary U.S. Work Locations and Key Partners





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Organizations Performing Work	Role	Type	Location
Nokomis, Inc.	Lead Organization	Industry	Charleroi, Pennsylvania
Armstrong Flight Research Center(AFRC)	Supporting Organization	NASA Center	Edwards, California

Primary U.S. Work Locations	
California	Pennsylvania

Project Transitions

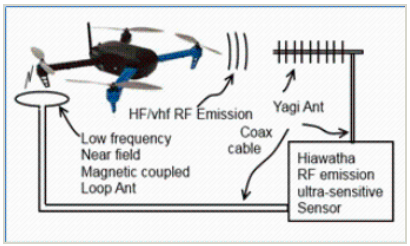
June 2016: Project Start

December 2016: Closed out

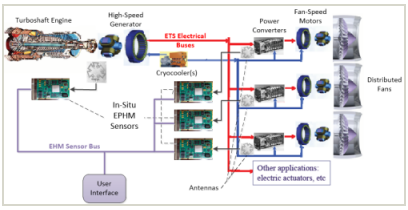
Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139578)*

Images



Briefing Chart Image
RF emission-based health monitoring for hybrid and/or all electric aircraft distributed propulsion systems, Phase I *(https://techport.nasa.gov/image/136603)*



Final Summary Chart Image
RF emission-based health monitoring for hybrid and/or all electric aircraft distributed propulsion systems, Phase I Project Image *(https://techport.nasa.gov/image/126308)*

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Nokomis, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

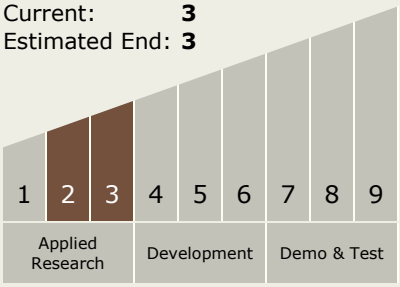
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
William A Davis

Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**



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Technology Areas

Primary:

- TX11 Software, Modeling, Simulation, and Information Processing
  - TX11.4 Information Processing
    - TX11.4.4 Collaborative Science and Engineering

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System